Input Instructions to the Diversions Package
For Each Simulation:
mxsr, mxsk, nstrctr, idivcb , idivflg, in_tab
1. Static data:
   a) Information for each set of source and sink areas, type of diversion, operation rules, and season parameters associated with a specific structure name are given as input (instructions herein).
   b) In addition, parameters to compute diversion flow by gravity through a drain structure using an analytical function for the ratting curve (i.e., weir flow) are also required.

For nstrctr number of structures:

	variable name	type	description	example
Structure:	strctr_name	char(16)	name of the structure	S-197,S-334
Surface Water Management-SWM package (FAU):	basin_name_src[1]	char(16)	basin name for the source area	R-S1,R-S3
	basin_name_snk[1]	char(16)	basin name for the sink area	R-S1,R-S3
Flow conditions:	source within aquifer active region?	{Y,N} char(3)	Source may be located inner/outer aquifer active domain (*e.g*., out of domain when using a surface storage)	Y,Y
	sink within aquifer active region?	{Y,N} char(3)	sink may be located inner/outer aquifer active domain (*e.g*., out of domain when using a canal as a sink)	Y,Y
	idiv flag for water way diversions	{0,1,2,3} integer	Flows are curtail by operational rules only if idiv=1. Only aquifer/wetland storage is updated by BCF. Sources and sinks storage are not updated. 1:historical and target pump diversion at structure, 2:drain structure without time lag, 3:drain structure with time lag of one time step	1,2
	eff_snk	real	Flow sink efficiency (*i.e.,* $eff\_snk = \dfrac{q^{sk}}{q^{sr}} 100$) Where q^{sr} is flow diverted at source set and q^{sk} is flow diverted at sink set	100.0,100.0

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[1] It is not implemented yet. However, you must supply a value

operation rules based on level/flow[2] for the wet season:	If q>0	lv_sr_on	real	lower limit of source head level	1.10,NA
		lv_sk_of	real	upper limit of sink head level	3.10,NA
	If q<0	lv_sk_on	real	lower limit of sink head level	1.30,NA
		lv_sr_of	real	upper limit of source head level	2.50,NA
	Max_flow		real	maximum flow curtail diversion flows	1.0E+06,NA
operation rules based on level/flow[2] for the dry season:	If q>0	lv_sr_on	real	lower limit of source head level	1.10,NA
		lv_sk_of	real	upper limit of sink head level	3.10,NA
	If q<0	lv_sk_on	real	lower limit of sink head level	1.30,NA
		lv_sr_of	real	upper limit of source head level	2.50,NA
	Max_flow		real	maximum flow curtail diversion flows	1.0E+06,NA
Start season:	Jd_str_wet[1]		integer	julian day for starting wet season for diversion purposes	180,NA
	Jd_str_dry[1]		integer	julian day for starting dry season for diversion purposes	300,NA
Equation parameters a drain structure, idiv=2 or 3:	c_0		real	$q^{sr} = c_0 + c_1(\Delta h)$ only for $q^{sr}>0$, and $h^{sr} > h_d$ where c_0 may be defined as the minimum flow, h_d is the weir elevation and: $$\Delta h = a_o + (h^{sr} - h_d)$$	NA,0.0
	c_1		real		NA,1.0
	a_0		real		NA,0.0

NA=no applicable. Fill up with any numerical value.

For each stress period:

2. Dynamic data:
   a) Cell locations associated with a given source or sink and its structure name. A source or sink can be located in either a wetland cell or any other active/inactive cell within the model grid system.
   b) For idiv=1, flow for each pumping station is provided by the GEN package. For idiv=2 or 3, weir elevation for each structure is provided by the GEN package.
   itmp_srsk
   The following record should appear itmp_srsk times:
   lay, row, col, type, strctr_name

   Type has two options: source or sink. strctr_name is the name of the structure controlling a specific diversion. This name may be up to 16 characters. Free formatting is used for the input instructions. One or more spaces, or a single comma optionally combined with spaces, must separate adjacent values.

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[2] q is the historical flow provided by the GEN package. h^{sr} is the average piezometric head elevation at source set and h^{sk} is the average piezometric head elevation at sink set. If q>0, it is assumed water is diverted from source area to sink area; otherwise, water is diverted from sink area to source area.

Dictionary of Variables used in MODFLOW coupled with the Diversion Package

Variable name	range	definition
mxsr		maximum number of source cells that can be active during the simulation.
mxsk		maximum number of sink cells that can be active during the simulation.
nstrctr		current number of structures for any idiv that can be used during the simulation
idivcb		both a flag and a unit number.
	>0	unit number on which cell by cell flow terms will be recorded.
	=0	cell by cell flow terms will not be printed or recorded.
	<0	diversions will be printed.
idivflg		a flag for echo in the MODFLOW List file: about structure flows for each time step.
	=0	Display warning and basic information
	>0	doesn't display any echo
	<0	echo full output is written in MODFLOW List file
in_tab		unit number from which static data is read for each simulation. By default, MODFLOW reads static data from the diversion input data set.
strctr_name		name of the flow or stage structure controlling a specific diversion. This name can no longer than 16 characters in length.
idiv		flag for each cell indicating water ways diversions. Values are curtail by operational rules for idiv=1. Sources and sinks storages are not updated. Only aquifer/wetland storage is updated by MODFLOW BCF
	=1	historical and target diversions or pumping flow is known or provided. Flow rate can be positive or negative.
	=2	diversion flow by gravity through a drain structure computed using an analytical function for the ratting curve (i.e., weir flow).
	=3	drain structure with lag of one time step
eff_snk		Flow sink efficiency
q		is the historical flow provided by the GEN package. If $q>0$, it is assumed water is diverted from source area to sink area; otherwise, water is diverted from sink area to source area.
qsr		Flow diverted at source set
qsk		Flow diverted at sink set
lv_sr_on		lower limit of the source (for $q > 0$) head level at the structure to be able to release water.
lv_sk_of		upper limit of sink (for $q > 0$) head level at the structure to be able to receive water
lv_sk_on		lower limit of the sink (for $q < 0$) head level at the structure to be able to release water.
lv_sr_of		upper limit of source (for $q < 0$) head level at the structure to be able to receive water
Max_flow		the maximum pumping rate assigned to a diversion
Jd_str_wet		Julian day for starting wet season
Jd_str_dry		Julian day for starting dry season
c0 , c1		coefficients for the flow rate equation. coefficients must be provided according to the units given by the model.
a0		coefficients for the head difference equation. coefficients must be provided according to the units given by the model.
itmp_srsk		both a flag and counter

Variable name	range	definition
	<0	diversion source and sink cell from the preceding stress period will be reused
	>=0	itmp_srsk is the number of both source and sink cells during the current stress period. It is recommended that large sink/source flows be distributed to several smaller source or sink if the values become very large.
lay,row,col		Location of the cell containing the source or sink diversion cell. In the case, the location of diversion is in an inactive cell or even outside of the model area, a value of zero should be provided for its layer. In a case a layer gets dry, water is only injected to underneath layer specified on input data set. -layer, row, column- at the model grid
type		indicates if is a source or sink
	SRC	source associated with a specified structure
	SNK	sink associated with a specified structure